Docket R2010-4R
GCA Initial Comments
Detailed Analysis

DETAILED ANALYSIS

I.   Introduction

The purpose of this detailed analysis is to present new evidence on the question of whether the 2008-2009 recession caused exceptional or exigent declines in the overall mail volume, and to what all the volume declines were caused by long run Internet diversion, or by short run recessionary factors by major postal product. *Three* factors not present when GCA filed its initial comments in R2010-4 help us to greatly simplify that analysis here, as well as to present an entirely new and more robust econometric approach to answering the question of exigent circumstances in this case. These factors are: (1) complete dating for 2008-2009 recession; (2) two full years of post-recession macroeconomic recovery data which helps to narrow and clarify what historical range of data to use to define an average, non-exigent recession; (3) two full years of post-recession single-piece volume data, the continuing downward trend of which is known to be caused by Internet diversion, enabling better econometric assessment of the impact of broadband diversion on FCLM mail volumes before, during and after the recession, and the extent to which the recession alone affected those volumes.

In our original work, the National Bureau of Economic Research (NBER) had not yet dated the trough of the 2008-2009 recession. Of necessity, this complicated significantly the analysis we conducted and the conclusions we reached because we had to draw inferences from three plausible troughs, June 2009, October 2009, and December 2009. We also had to define an "average recession" in multiple ways using post war data only, pre war data, and all historical business cycle data. As the Commission noted in Order No. 547 at page 51:

> As a concept, the notion of decomposing an extraordinary or exceptional event into a normal portion and an exigent portion and using that analysis to estimate a range of acceptable exigent rate increases would appear to have merit. However, GCA's

application of this conceptual approach demonstrates the difficulties inherent in quantifying the portion of a complex economic event that should be considered normal and any portion that should be considered abnormal.

NBER has since dated the end of the recession as June 2009, rendering it an 18 month or six quarter event. This makes it far less difficult to compare the 2008-2009 recession with past recessions. In particular, there do not appear to be any remaining "difficulties inherent" now in measuring the precise degree to which the 2008-2009 recession was a normal recurring event as all recessions are, and the degree to which the severity of the recession was an exceptional, or exigent, event.[1]

To measure the non-exigent part of the 2008-2009 recession, it is necessary to calculate what has been a normal or recurring event by taking the average of past recessions. Dating the trough of this recession helps considerably in making it less difficult to do this, the process being less complex and offering greater precision. The other factor in determining an average recession is how far back one should go in the past in order to calculate the average. The answer to this issue makes a very large difference in determining the magnitude of an average U. S. recession, and hence in determining how much of the 2008-2009 recession was an exigent event. The major question here is whether the 2008-2009 recession was just another in a string of post World War II recessions, during which Keynesian automatic stabilizer policies made the recessions less severe than pre-war recessions, which were affected more by free market laissez-faire, or pre-Keynesian economic conditions.

The new information now available to answer this question comprises the dating of the trough of the 2008-2009, rendering it an 18 month recession, as well as the subsequent

---

[1] While the Commission in its Order also found GCA's concept to have merit, it was not discussed in the remand decision of the U. S. Court of Appeals for the D.C. Circuit, since the dispositive legal issue did not require it to be discussed. Instead, the Court directed the Commission, as the agency charged with implementing section 3622(d)(1)(E), to decide for itself the meaning of "due to." Whether an extraordinary or exceptional event can be composed of an exigent portion and a non-exigent portion, or whether it is an all or nothing proposition, is clearly a significant part of that interpretative exercise. "How close" an adjustment should be to the financial impact of an exigent event in this case, and perhaps in most cases, seems obviously tied to what portion of the event claimed as exigent was truly extraordinary or exceptional.

nature of the recovery. The course of the economic recovery since June 2009 is two years old and can be compared with recoveries from past recessions.

Data from two years of economic recovery include further information on the course of Internet diversion of the mail. This is very significant in helping to ascertain whether the recession was an exigent event, or to what degree it was.[2] Two years of post-recession experience with postal volumes during economic recovery and the impact of diversion on them enable a much more accurate analysis of the relative contributions diversion and the recession made to postal volumes during the 2008-2009 recession than was possible in our initial comments. We now have pre-recession, recession and post-recession data on Internet diversion from which we can estimate the current long run trend of that source in explaining declines in FCLM. From that trend using post-recession data, we can separate that portion of the volume decline due to the Internet during the six quarters of the recession from that portion explainable by the short term influences of the recession.

The course of the economic recovery since June 2009 is important for yet another reason. While GCA found in its initial comments that some portion of the 2008-2009 recession was exigent, depending how far back one included past recessions in the calculation of an average (or non-exigent) recession, it also argued that no exigent rate increase was warranted because the evidence showed that mailers, and businesses across the board, were unable to raise their prices at all during the recession and that USPS should not be allowed by regulatory largess to do so either. USPS had already raised prices by 4.9% across the board in FY 2009 at a time when the economy was actually experiencing deflation, thus raising the real wages and benefits of all postal employees without any rate change.

---

[2] In its initial comments, GCA did attempt to net out from FCLM volume decreases the amount that might be due to secular or long run Internet diversion from the short run impact of the recession. At the time, before the trough of the recession was known, we had to rely only on past trends of diversion for estimating its course during the recession.

With recovery there has been an up-tick in inflation as one would normally expect. The rationale above that GCA used for no exigent rate increase in its initial comments does not apply to current circumstances, although we feel it is still a valid argument for the linkage under examination in R2010-4, whether a rate increase for the Postal Service was justified when it was requested, less than a year after the recession ended..

II.   What Percentage of the 2008-2009 Recession Was a Normally Recurring Cycle in Macroeconomic Activity Given What We Know Now, Two Years After It Ended?

   A.   The 2008-2009 Recession Was Eighteen Months, Longer than Any of the Other Ten Post-War Recessions and the Same as Five of the Eleven Pre-War Recessions

GCA noted in the detailed analysis accompanying its initial comments in the first phase of this case, at page 5, that:

> the peak to trough of the 2008-2009 recession measured by the fall in GDP, for example, is not the right quantitative measure of the "exceptional" exigent circumstance. Only that portion of the peak to trough in 2008-2009 that exceeded the decline in GDP in a typical recession is exigent, and that percentage depends, in part on what the historical comparisons that define the norm are.

Table One from our original analysis showed the peaks and troughs for all U. S. recessions for which the National Bureau of Economic Research (NBER) has suitable data, from the 1857 recession through the present. The last three columns ranked each recession by degree of severity defined as months from peak to trough, starting with the worst U.S. recession at the top of the list. NBER has dated the end of the 2008-2009 recession as June of 2009, making this peak to trough 18 months in duration. Here, we reproduce Table One as Table A1-1 in Appendix I with the changes the formal dating of the recession requires. The historical ranking of the 2008-2009 recession appears in bold.

The first quintile in Appendix I, Table A1-1 lists the seven worst recessions in U. S. history. The 2008-2009 recession appears in the second quintile as the most recent among

five other recessions that was also 18 months long. Out of 32 total recessions in recorded U.S. history, excluding   2008-2009, the thirteen most severe all happened before 1935. The only modern American recession that falls within the thirteen most severe is the 2008-2009 recession. If only recessions prior to 1935 are used as the comparison to 2008-2009, at an average 21.2 months, then the 2008-2009 recession was modestly milder than that average. Under GCA's concept, no exigent rate increase would apply to a recession of average or below average length.[3]

An alternative way to compare all past U. S. recessions with that of 2008-2009 is to essentially break them into three groups, as was done in our initial detailed analysis in Table Two, reproduced here as Table A1-2 in Appendix I with corrections to the data now that the length of the recent recession is known. While the exact dividing lines between the three classifications "mild", "moderate", and "severe" are subjective to some degree, the 2008-2009 recession falls at the highest end of the moderate recessions, just below the seven most severe recessions in recorded U. S. history.

Many would define the 2008-2009 recession as a severe one rather than the most severe of the moderate recessions, although this opinion is based more on the personal experience of those alive today than the broader range of recessions. Under our classification for a severe recession in Appendix I,   Table A1-2, the 2008-2009 recession was only half as severe as the average U. S. severe recession (50.8 percent). By these measures, the 2008-2009 recession in its entirety was not exceptional or exigent.[4]

---

[3] The question of exigency in this rate case is highly dependent on the time period used for the recession comparisons. Ranking them, 62 percent of the recession was an exigent circumstance if only post-war recessions including 2008-2009 are considered in the comparison. However, if all U. S. recessions are used as the comparison, then the 2008-2009 recession was barely 3 percent greater than the average with little or no exigent component.

[4] By comparison with other moderate recessions in U. S. history, the 2008-2009 recession was 17.6 percent higher than the moderate average. The inference would be that 17.6 percent of the recent recession and its impact on postal volumes was exceptional and thus exigent.

B.   Was Any of the 2008-2009 Recession an Exigent Event in Light of New Data?

In its Order No. 547, the Commission noted:

> GCA's comments are helpful in explaining why the recent recession is unique in America's post-World War II experience. Not only was the recent recession unique in kind and severity in post-war America, its impact on the Postal Service was unique in kind and severity as well. The credit crisis disproportionately damaged the very economic sectors on which demand for postal services depends most—real estate, banking, mortgage lending, credit card lending, insurance, and advertising.

> The Commission finds GCA's analysis of the recent recession as only partly exigent to be a useful contribution to the record in several areas, particularly its discussion of the nature and causes of the recent recession on which the Postal Service predicates its Request.

Order No. 547, pp. 50 and 51, respectively. GCA's original analysis was done in mid- 2010, when the dating of the end of the recession was still undetermined. As it turns out, that analysis was completed only one year after the official end of the recession in June, 2009. Given our knowledge of the recession at that time and the uncertain dating of the trough, either the recession had not yet fully ended or the recovery was extremely weak and anemic compared with past recoveries.

We now know that it was the recovery from the 2008-2009 recession that was very weak in mid-2010. We also have over a year's additional worth of data, and the pace of the recovery continues to be very weak, with some concerns that a "double-dip" recession may be on the horizon. These facts surrounding the depth of the 2008-2009 recession and the unusual weakness of the recovery since then, add extra weight to one tentative conclusion from our original analysis, namely that one cannot use post-war recessions or post-1970 recessions under the Postal Reform Act (PRA) alone to define what constitutes an average recession from which we can compare the 2008-2009 recession. Postal Service management's experience would naturally have a post-war or post-1970 Postal Reform Act focal point for comparison, but such a focal point is simply incorrect as we now can firmly conclude. There is nothing about the 2008-2009 recession or the recovery from it that

corresponds to any post-war economic recession. Any continued use of such a comparison, in light of currently available data, appears to be a "mission-oriented" one, aiming to generate the revenue increase USPS thinks necessary, rather than applying the exigency clause in PAEA with the analytical objectivity it requires in this case.

Unlike GCA's more complex range of twelve options in its initial detailed analysis, the choices for comparing the 2008-2009 recession (and recovery) are in our view now limited to only two: using recorded U. S. data on all past U. S. recessions, from 1857 through the present, or using only pre-War recessions for comparison. The latter corresponds roughly to what economic historians call the "pre-Keynesian" world, before the application of Keynesian "automatic stabilizers" as national policies that could and did reduce the amplitude of economic cycles after WW II.

Table Three A from GCA's initial detailed analysis indicated what the exigency factor would be under a variety of assumptions for dating the end of the recession and defining what an average recession was. There are only two possible exigency factors now since the length of recession is known and the nature of the recovery is known: (1) Using an average of all U. S. recessions, the exigency factor is 3%, i.e. the drop in mail volume from peak to trough that is exigent is 3%, the drop that is due to a normal recession of average length as defined that is non-exigent is 97%. (2) Using an average of pre-war recessions, the exigency factor is 0%. At most, the Commission could raise prices in response to the exigent rate request by 2/10 of one percent on average, not the 5.6% requested by the Postal Service if the Commission interprets the "due to" statutory clause in PAEA as a very close linkage between the exigent event and the proposed adjustment.

In summary, the 2008-2009 recession in retrospect was no more than an average U. S. recession in the course of events, and does not qualify as an "exceptional" event in the sense of PAEA's exigency clause. The tendency of the Postal Service (especially since March 2010) to use dire predictions covering a long time span and, in particular, to cite current financial woes due to *many* factors, rather than objective macro-economic analysis, in the debate over whether or not to grant the Postal Service request for an exigent

increase of 5.6% (or a part of that) is assuredly out of place in light of the Court of Appeals' decision. The Commission's initial decision for no exigent rate increase may have been correct except for inadequately developed interpretation of the statutory language, as the Court of Appeals indicated in its opinion, but it *was* correct. Economic events since the Commission's initial opinion render its verdict on the question even more sound, especially in light of the very narrow legal grounds for remand of this case and the exigent circumstances the Postal Service argued for.

III. New Evidence on What Portion of the 2008-2009 Volume Decline During the Recession Was Driven by Internet Diversion for First Class Letter Mail

A.   First Class Single Piece letters and Total Periodicals

In its Order No. 547, the Commission notes that a decrease in the volume of mail due to electronic diversion is not an exigent circumstance. On this point, the Commission, the Postal Service and most opponents of the proposed rate increase all agree.

> [S]ome opponents of the Request emphasize that the diversion of mail volume to electronic alternatives is a long-term trend that does not qualify as an "extraordinary or exceptional circumstance." Both the Postal Service[5] and the Commission agree. Declines in volume that arise from the normal life cycle of a product, or set of products, would not come within the plain meaning of those terms.
>
> Docket No. R2010-4, Order No. 547, p. 52.

Two years of post recession experience with postal volumes during economic recovery and the impact of diversion on them enable a much more accurate analysis of the relative contributions diversion and the recession made to postal volumes during the 2008-2009 recession than was possible in our initial comments. We now have pre-recession, recession, and post-recession data on the impact of Internet diversion on mail volume, from

---

[5] *See* Postal Service Response to Motion to Dismiss at 13, n.2.

which we can estimate the current broadband-driven, long run trend in explaining declines in FCLM. From that trend using post-recession data, we can separate that portion of the volume decline due to the Internet during the six quarters of the recession from that portion explainable by the short term influences of the recession. This is very significant in helping to ascertain whether the recession was an exigent event, or to what degree it was, quite apart from our revision of our original detailed analysis in Section II above.[6]

We performed linear and non-linear best fits to postal volume data from the first quarter of PFY 2005 through the second quarter of PFY 2011 using RPW data. For each estimation, all the data except the six quarters of the 2008-2009 recession was run to establish the current long run trend in internet diversion absent the short term influence of the recession. Then, all the postal volume data for that estimation was re-run using all the data including the six quarterly observations from the recession. If the recession had an independent and observable impact on the fall in single piece mail volume, it would show up as a difference in the two estimated equations, notably in the slope coefficient. The smaller the difference in the equations, the less the influence of the recession.

The equations estimated for single piece letters are:

(1) $y = -182.71x + 11700$ $R^2 = 0.8079$ Recession data excluded

(2) $y = -187.72x + 11719$ $R^2 = 0.8002$ Recession data included

The linear equations are both reasonable fits to the quarterly data, with the level of statistical significance exceeding 80%.[7] The current long run trend of declines in single

---

[6] In its initial comments, GCA also attempted to net out from FCLM volume decreases the amount that might be due to secular or long run Internet diversion from the short run impact of the recession. At the time, before the trough of the recession was known, we had to rely only on past trends of diversion, including the distant past before the advent of broadband, for estimating its impact during the recession.

[7] Using non-linear techniques for estimating both data sets for single piece, it proved impossible to identify any non-linear trend that materially out-performed the linear estimation values used in equations (1) and (2 The R^2 in the quadratic non-linear estimation was 0.8181 for the data set excluding the recession and

piece volume from internet diversion established in the first equation is nearly identical to the values and significance in the second equation. The comparison indicates that even if there had not been a recession in 2008-2009, single-piece volumes would have continued to fall at the same rate that they did during and after the recession.

The results strongly suggest that one cannot discern any material impact of the recession at all on single-piece volumes. If there were any material impact, especially given the severity of the recession, the slope coefficient in equation (2) above would be significantly lower than that in equation (1), indicating a further drop in volume than the amount that could be explained by the impact of internet diversion alone when the quarterly data from the recession is included in the linear estimation. Figure 1.A below makes the point visually. Had the recession had a material impact on the course of single-piece volumes, apart and separately from internet diversion, the solid line including the recession data would have a noticeably different slope than the dashed line indicating the current long run broadband diversion of single-piece letters. However, including volume data from the 2008-2009 recession does not impact the broadband trend line at all. Had the recession never happened, single-piece volumes would have fallen at the same rate due to broadband diversion as they in fact did during and after the 2008-2009 recession.

With respect to economic evidence surrounding the Commission's task in this case to clarify the legal meaning of "due to" in PAEA, none of the drop in single-piece volume over the course of the recession (or since) was "due to" the recession. The exigency factor for single-piece letter mail is zero in light of these findings.

0.8045 for the estimation including the recession data. This conclusion was not true for any other mail classification analyzed other than Periodicals mail.

Figure 1.A
Single Piece Mail Volume Over 2005-2011
**with Linear Trend**
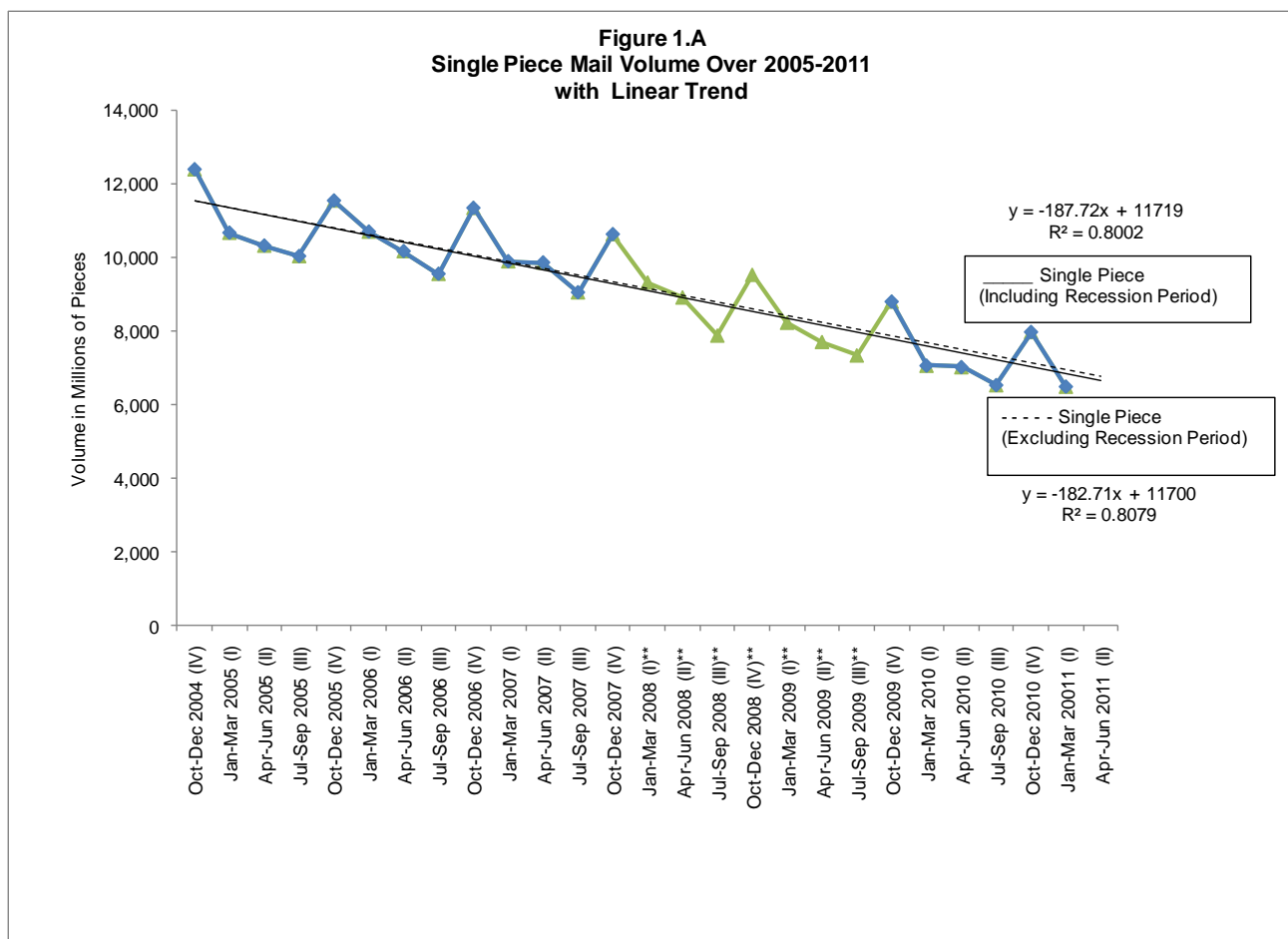
The conclusion for total Periodicals is the same as for First Class single-piece letter mail. Internet diversion explains virtually all of the decline in Periodicals volume over the 2008-2009 recession. As with single piece, virtually no volume figure during the recession can be explained by the impact of the recession per se on Periodicals. The best fit for total Periodicals turned out to be a quadratic estimation technique rather than a linear one, as seen from the equations below and in Figure 1.B. following.

(3) $y = -0.7457x^2 - 2.9118x + 2301.2$ $R^2 = 0.9265$ Recession data excluded

(4) $y = -0.8722x^2 + 0.1965x + 2292.2$ $R^2 = 0.9024$ Recession data included

11

Figure 1.B
Periodicals Mail Volume Over 2005-2011
with Non-Linear Trend

$y = -0.8722x^2 + 0.1965x + 2292.2$
$R^2 = 0.9024$

_____ Periodicals
(Including Recession Period)

- - - - - Periodicals
(Excluding Recession Period)

$y = -0.7457x^2 - 2.9118x + 2301.2$
$R^2 = 0.9265$
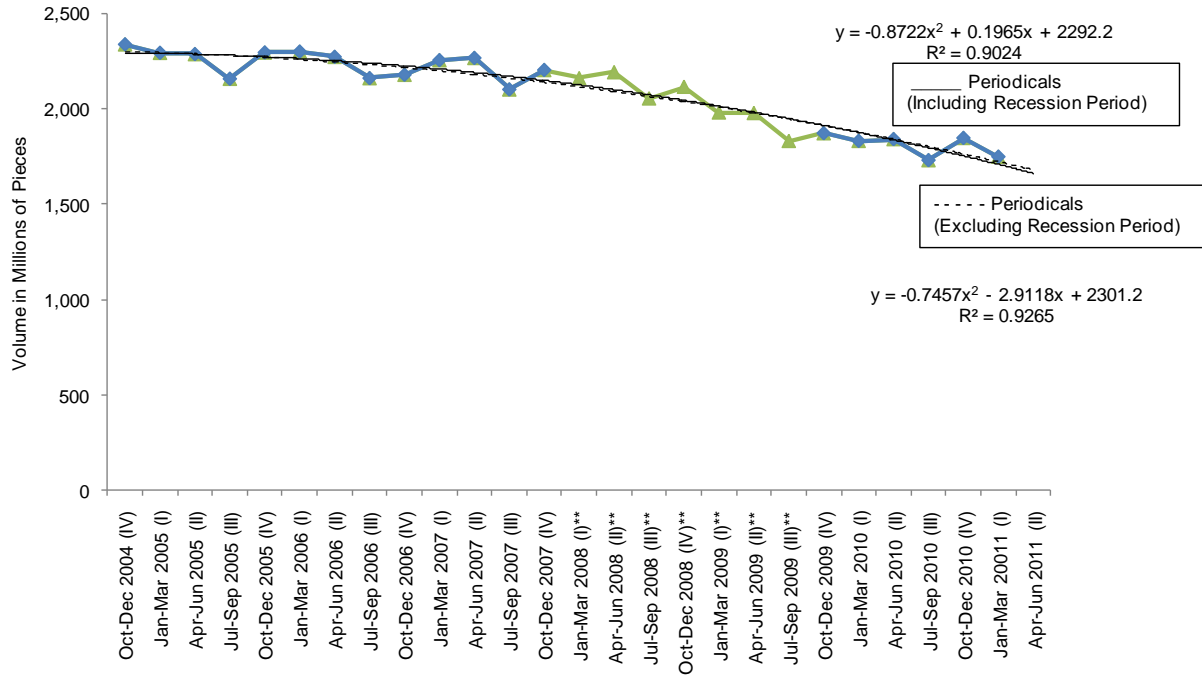
For all remaining major mail classifications and some combinations thereof, Appendix 2 discusses the equations and corresponding figures based on running linear and non-linear estimating trend lines for data that, like those earlier, omit the recession, which starts the drop in the first quarter of 2008 and ending with the trough in nearly all the actual mail volume data.[8]

B.   How Did the Recession Affect Other Mail Classifications Compared to Its Negligible Impact on First Class Single-Piece Letters?

---

[8] This exceeds the formal dating of the macroeconomic trough by one quarter.

For comparative purposes the linear or non-linear best fits to the data including the recession can also be compared with trend data that, in the first instance, can be estimated from pre-recession data alone. That is because if the recession did influence any mail classification volumes negatively, the actual post-recession data would not reflect the trend that would have occurred absent the recession. That trend would start from a higher base for Qtr 3 2009, the volume that would have existed in that quarter had the recession never occurred. The data from Qtr 3 2009 through Qtr 1 2011 absent recession would in essence be a scalar above the actual data for each quarter. For single-piece and Periodicals, however, the post-recession volume data would not start from a higher forecasted volume trend line than the actual data. No upward adjustment is appropriate because the recession did not affect single-piece or Periodicals.

B.1.   All First Class Letter Mail

We performed linear and non-linear fits to postal volume data from the first quarter of PFY 2005 through the second quarter of PFY 2011 using all RPW data currently available including the six recessionary quarters using the same analytical estimation as that in Section III.A. above. Beyond all First Class mail letters, Presort and Single-Piece, the data includes flats and parcels, but nearly all the volume reported is letter mail. To establish the current long run trend in FCLM volume absent the short term influence of the recession, we used pre-recession data alone with a linear assumption.

If the recession itself had a material, independent and observable impact on the volume of FCLM as a whole, it would show up as a large vertical gap between the two estimated linear trend lines during the recession in <u>Figure 2. A.</u> below. There is an asterisk next to each quarter labeled in the figure that is a recessionary quarter (2008 1 – 2009 3). The smaller the gap between the two lines, the less the influence of the recession. Using a non-linear assumption with all the volume data included in <u>Figure 2.B.</u> does not change the

gap.   The very small degree to which the recession impacted FCLM volume compared to the impact of Internet diversion stands in stark contrast to Figure 4, the recession's impact on Standard letter mail. (See page 16).
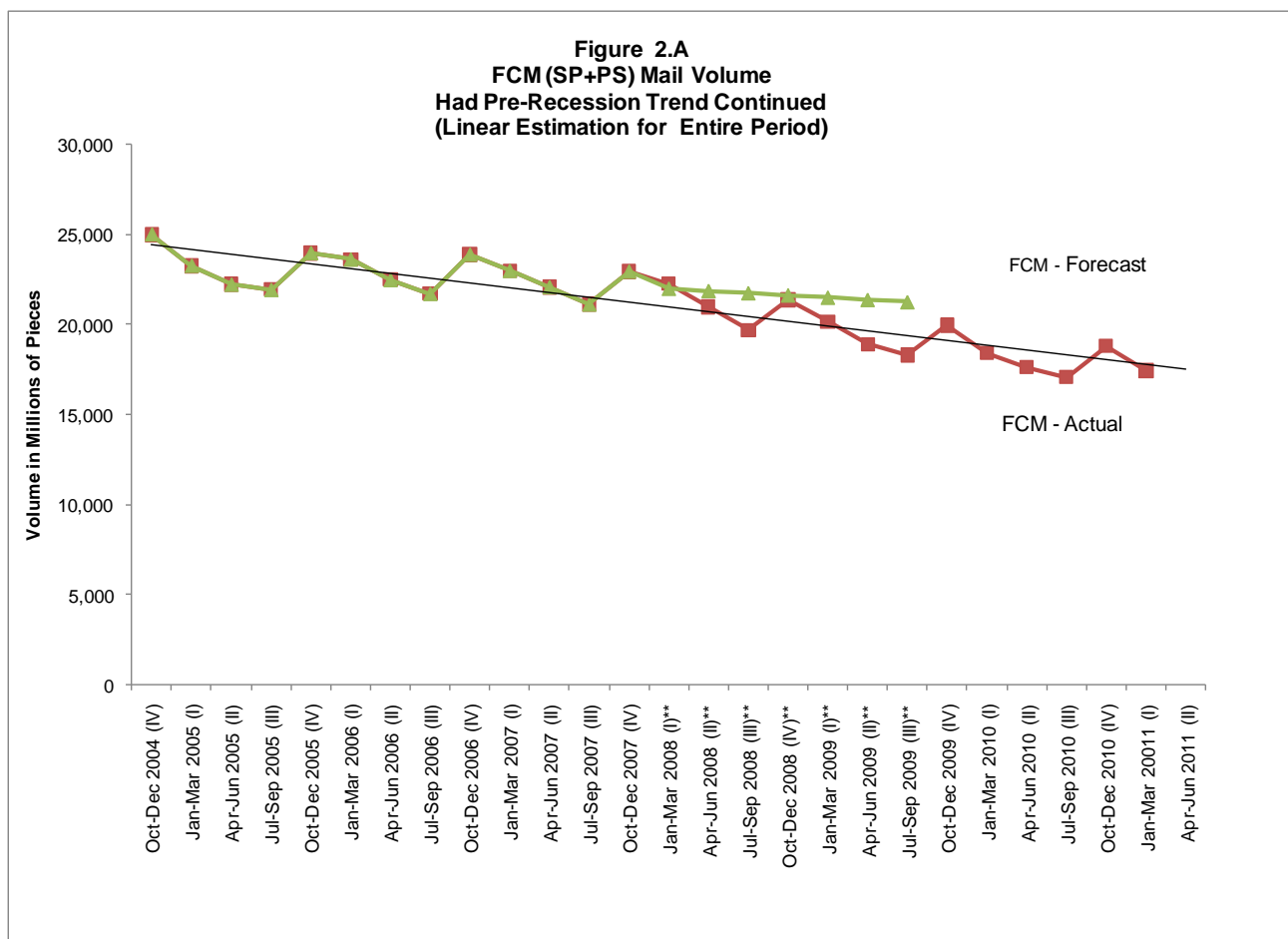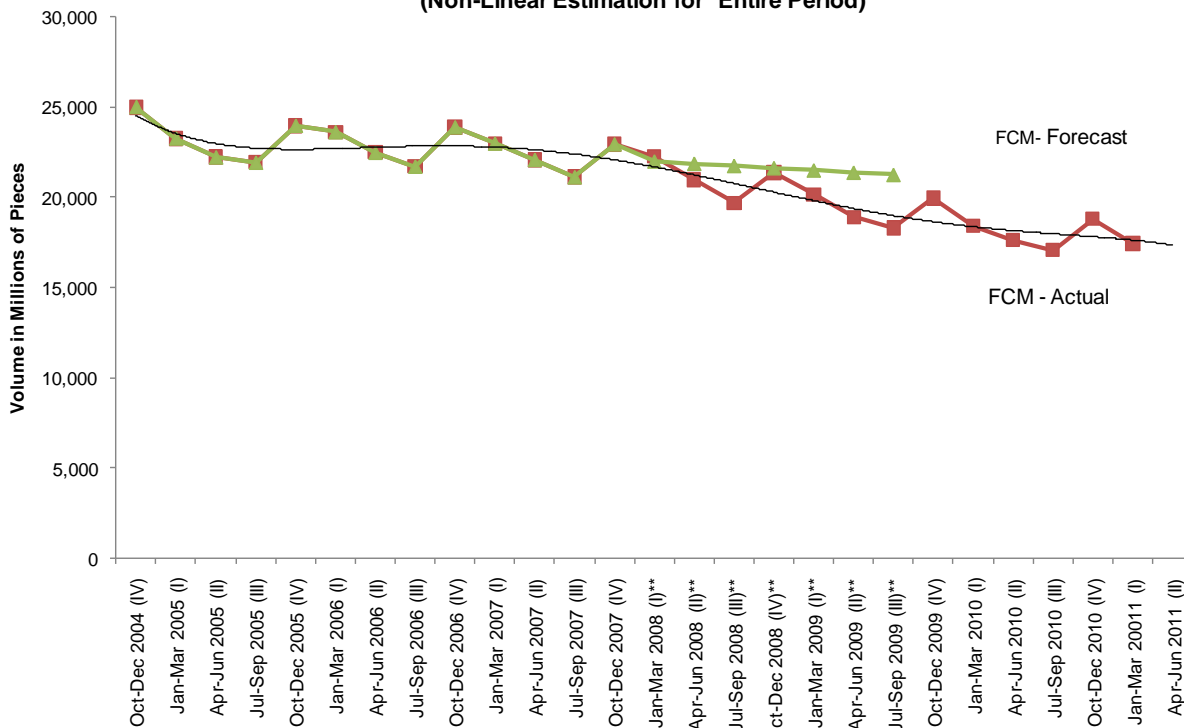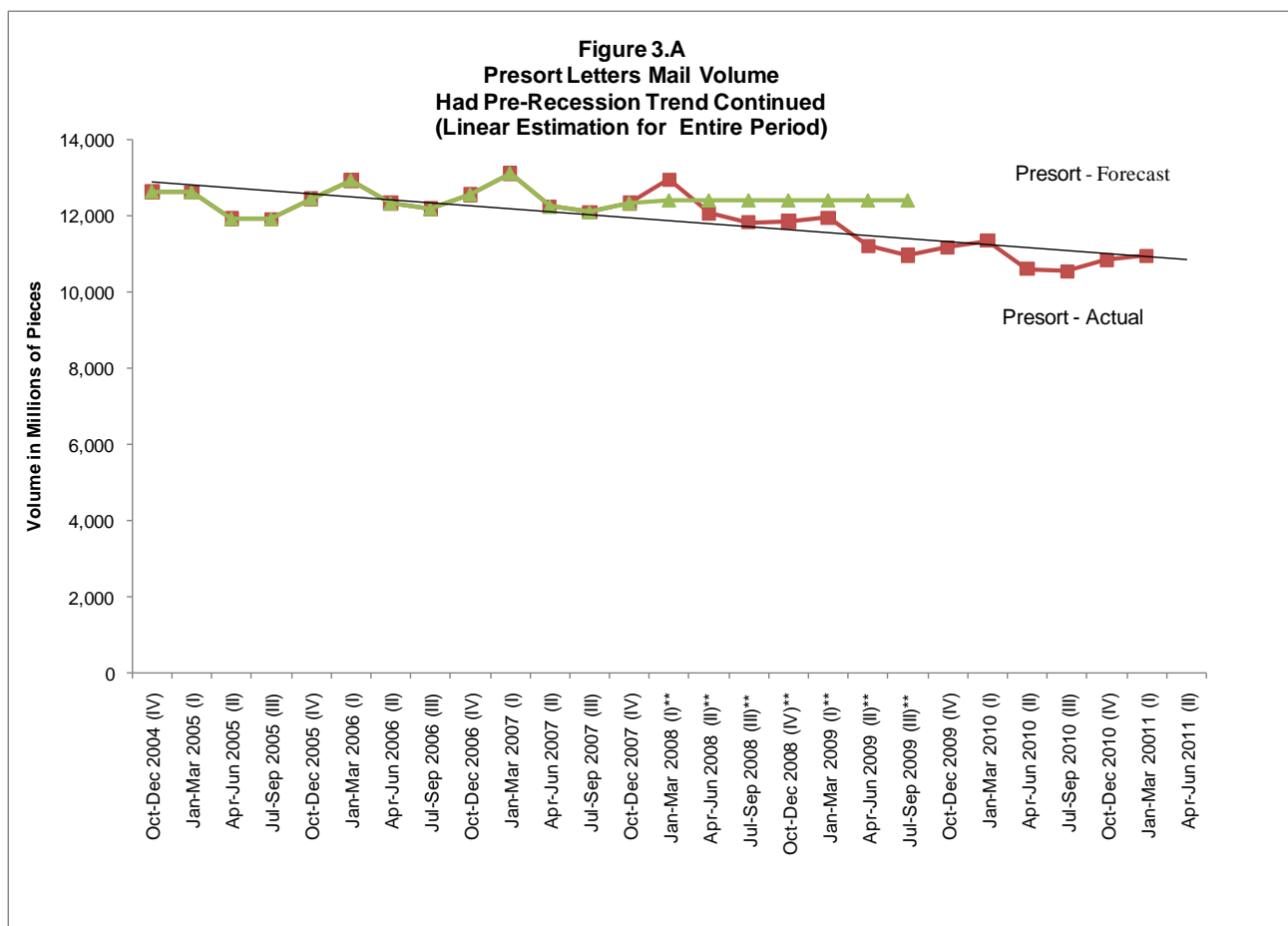
Figure 2.A
FCM (SP+PS) Mail Volume
Had Pre-Recession Trend Continued
(Linear Estimation for Entire Period)

Figure 2.B
FCM (SP+PS) Mail Volume
Had Pre-Recession Trend Continued
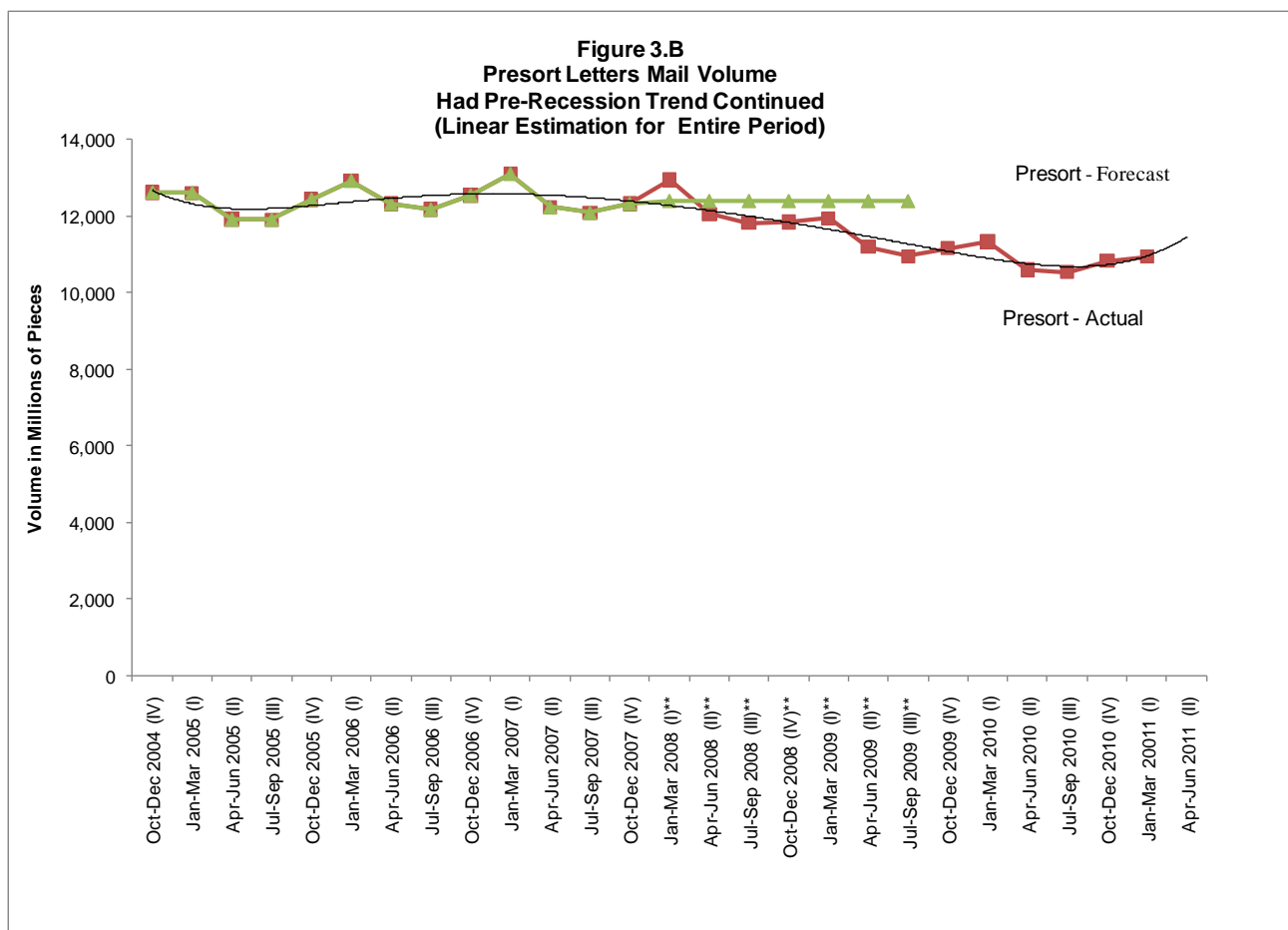**(Non-Linear Estimation for Entire Period)**

B.2. First Class Presort letters

We performed linear fits to postal volume data from the first quarter of PFY 2005 through the second quarter of PFY 2011 using RPW data. All the pre-recession data except the six quarters of the 2008-2009 recession was run to establish the long run trend in Presort volumes absent the short term influence of the recession. The result appears as the top line in Figure 3. Then, all the postal volume data including the six quarterly observations from the recession was estimated, and appears as the linear trend line through all the actual data, pre- and post-recession data as well as the volume data for the six quarters of the recession. As with FCLM above, if the recession had an independent and observable impact on Presort volume, it would show up as a difference in the two estimated trend lines.

Figure 3.A
Presort Letters Mail Volume
Had Pre-Recession Trend Continued
(Linear Estimation for Entire Period)

One significant conclusion from the Presort estimations is that, unlike single piece and periodicals discussed later, had there been no recession, Presort volumes would have trended upward by a small amount as seen in the top line of Figure 3.A. The linear trend that occurred from all the actual volume data indicates to the contrary, that Presort volume has fallen mildly, reflecting some influence from the recession. The gap using non-linear estimation in Figure 3.B. indicates somewhat more influence on Presort volume attributable to the recession than the linear results do, but there is not a large difference in the gap between the two approaches. Internet diversion has been a factor reducing the long run rate of growth of Presort but not by itself causing any clear-cut absolute decline.

Figure 3.B
Presort Letters Mail Volume
Had Pre-Recession Trend Continued
(Linear Estimation for Entire Period)

B. 3.   Standard Letter Mail

We performed non-linear fits to actual postal volume data for Standard letter mail from the first quarter of PFY 2005 through the second quarter of PFY 2011 using RPW data. It is obvious from the course of actual volumes during the recession and early quarters of recovery, that only a non-linear approach could reasonably fit the Standard letter data that actually occurred. The pre-recession data alone was then run to establish the long run trend in Presort volumes absent the short term influence of the recession. The result appears as the top line in Figure 4

17

Figure 4
Standard Letters Mail Volume
Had Pre-Recession Trend Continued
(Non-Linear Estimation for Entire Period)
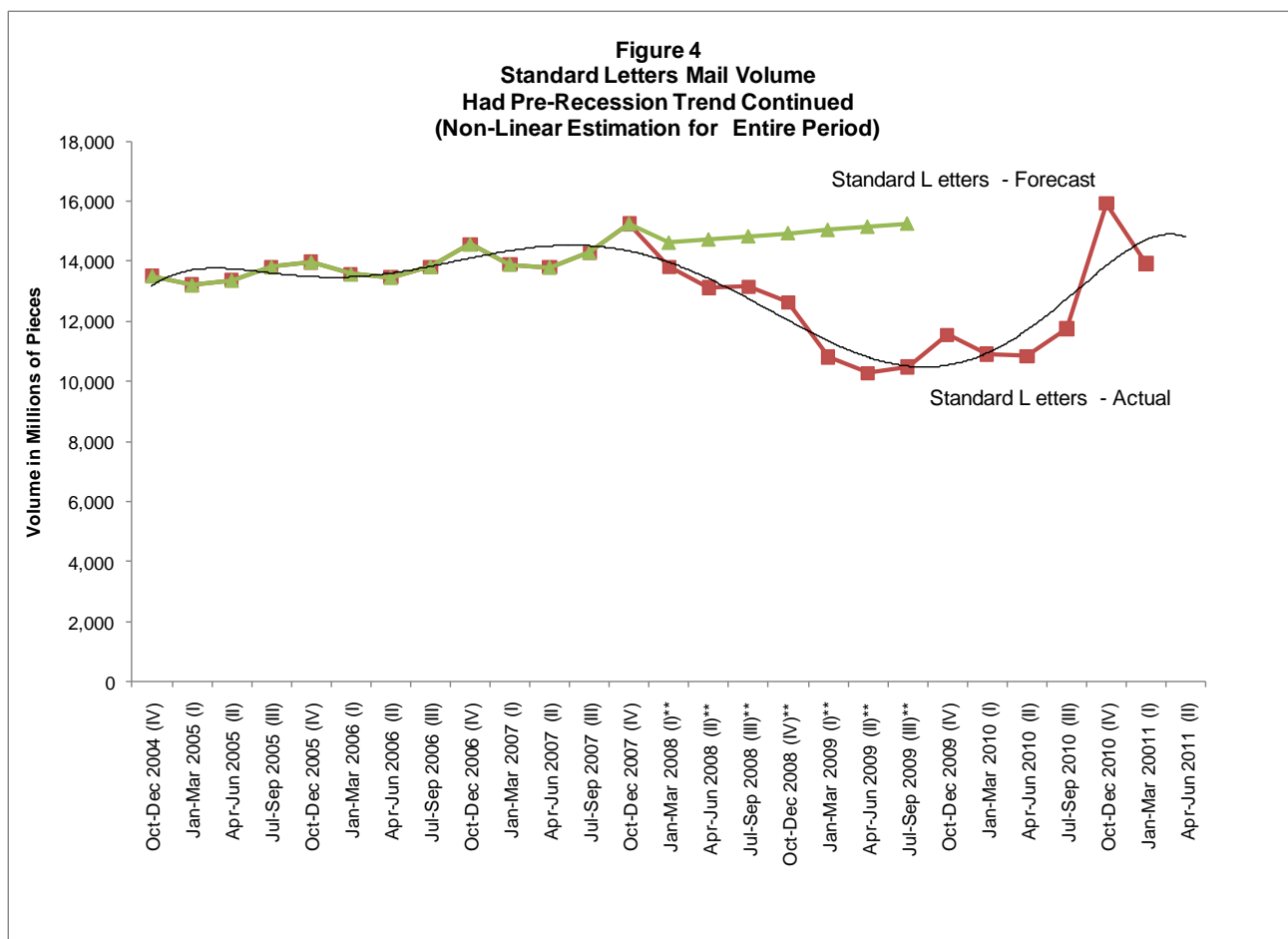
Compared to the results for First Class letters in Figure 2.A. and 2.B. above, however, there is a very large difference between the two best-fit trend lines for Standard letter mail. The 2008-2009 recession did have a material, indeed a very substantial downward impact on Standard letter volumes, far greater than any impact the recession had on FCLM generally, and single-piece in particular. The long run trend in volume for Standard letters absent the recession is moderate positive growth for a mature product as shown by the top line in Figure 4, greater than mild long run growth in Presort. The recession disrupted that secular, long run trend for Standard letters, but the actual data also indicates that Standard letter mail volumes recovered relatively quickly after the recession. In summary, Standard letter volumes fell during the 2008-2009 recession "due to" the recession and for no other apparent reason, before recovering and resuming their normal pattern of moderate growth.

<u>B. 4.   First Class Single-Piece Letter Mail and Periodicals Mail</u>

Figure 5 and Figure 6 portray the relative impact of the recession on First Class single-piece letters and total Periodicals mail, respectively. Unlike the results for Standard and Presort, which had rising volume trend lines absent the recession, the trend line forecasts for single-piece and periodicals were for falling volumes absent the 2008-2009 recession. Figure 5 and Figure 6 show the recession had a small impact on single-piece letters. To some degree, however, "no impact" from Figures 1.A. and 1.B. compared to the results here is due to the difference in estimation techniques as between Section III. A. and the estimation techniques employed here in Section III. B. Either way, the impact of the recession on Periodicals and single piece is very minor or non-existent compared with its impact on Standard letter mail.

The downward slope of actual trend lines as well as forecasted ones absent recession for single piece and periodicals is significant. The falling trend lines indicate the presence of broadband diversion, a factor not evident at all in the rising trend lines of Standard and apparent only in the marked slowing of the growth in Presort letters.

Figure 5
Single Piece Letters Mail Volume
Had Pre-Recession Trend Continued
(Linear Estimation for Entire Period)
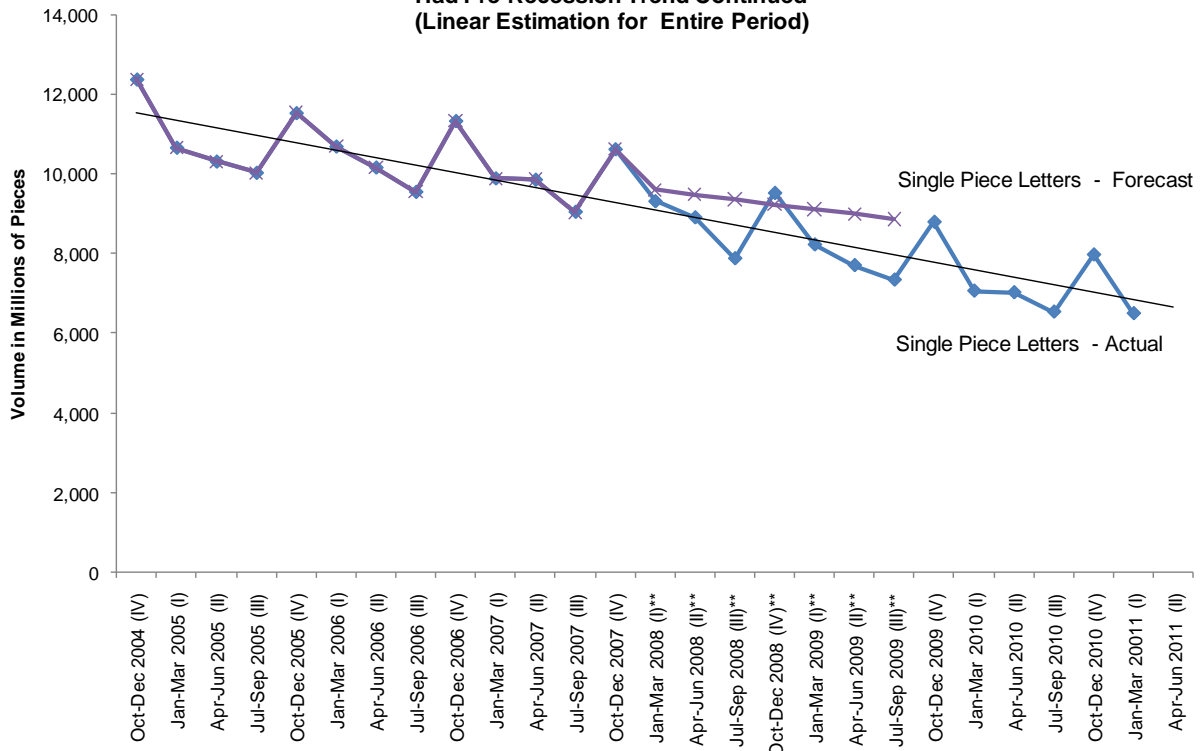
Figure 6
Periodicals Mail Volume
Had Pre-Recession Trend Continued
(Non-Linear Estimation for Entire Period)
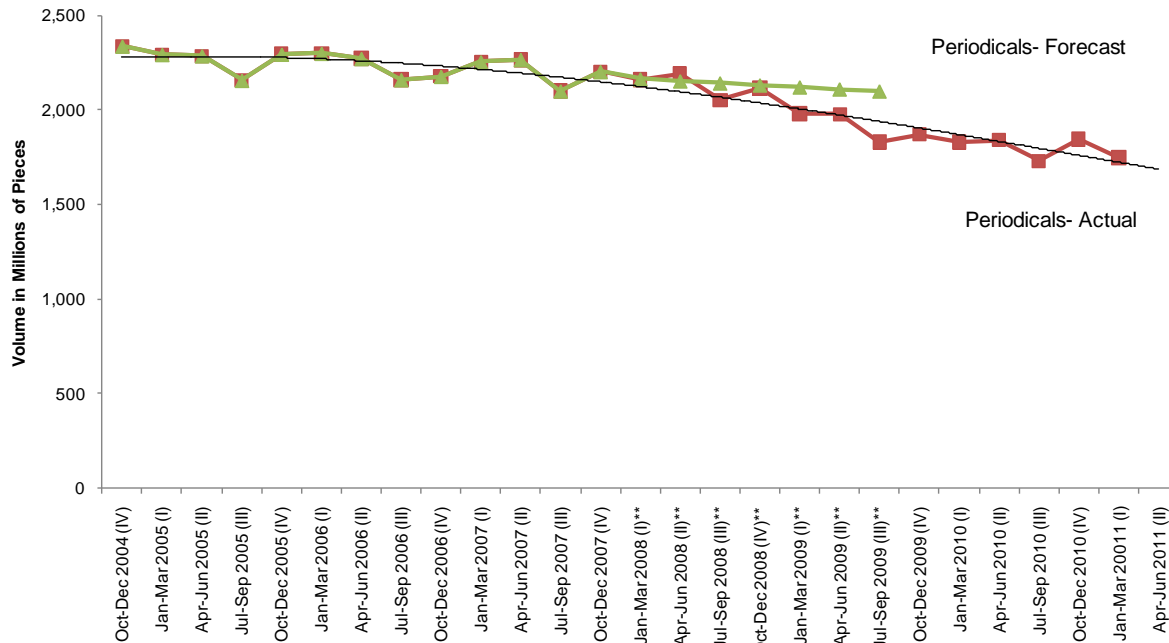
IV.   Summary: Was There Any Cyclical Impact on Mail Volume from the 2008-2009 Recession?

Our revision of the original detailed analysis from GCA's initial comments in this case in Section II. above indicates that in the aggregate, there was a cyclical impact, but that the impact generally speaking across all mail volume was no greater than that of an average recession properly defined. Because normal recessions are recurring events, no exigent rate increase is warranted by the Commission in response to the Postal Service's request in R2010-4.

The entirely new analysis in Section III. above breaks the answer to the question down into the major mail categories. The comparisons made do not relate to, or depend on,

any view of what the correct measure is of the "average recession". Rather, the question that is posed is different: did the 2008-2009 recession have any different impact on one mail category compared to another?

The most robust case for no exigent rate increase in light of Section III. conclusions above is for First Class single-piece letter mail and Periodicals, that the recession did not impact the secular decline in single-piece volume, which decline is driven by Internet diversion.The estimated equations indicate that Internet diversion present both before and since the recession, explains virtually all of the volume declines in single piece during the 2008-2009 recession. Internet diversion also appears to explain the drop in Periodical volume during the recession.

Absent the recession, Presort volumes were trending flat from the pressure of Internet diversion, possibly increasing by a very small amount. The relatively modest declines in actual Presort volumes "due to" the recession compared to the forecasted trend absent recession must also be evaluated with respect to the conclusions reached in Section II. If one were to define a normal recession, the entire decrease in Presort volumes "due to" the 2008-2009 recession in all likelihood would fall within the range that would be fully captured by a normal recession as we have defined it in Section II. On those grounds, no exigent rate increase would be warranted for Presort letters.

It is far less certain that the drop in Standard letter mail volumes "due to" the 2008-2009 recession would fall within the boundaries of an average recession as defined in Section II. Indeed, most all the drop in overall mail volume during the 2008-2009 recession "due to" the recession is from Standard mail. If the Postal Service has any case for an exigent increase in this remand case at all in light of our findings in Section III., it would be for Standard mail and Standard mail alone. If the issue is not examined mail category by mail category, but only in the aggregate as total mail volume as in Section II., then no exigent rate increase is warranted on any mail including Standard.

Appendix 1

Table A1-1
U.S. Business Cycle Expansions and Contractions

BUSINESS CYCLE REFERENCE DATES		DURATION IN MONTHS	BUSINESS CYCLE REFERENCE DATES RANKED		
Peak	**Trough**	**Contraction**	**Peak**	**Trough**	**Rank**
Quarterly dates are in parentheses		*Peak to Trough*			
			First Quintile		
			October 1873(III)	March 1879 (I)	65
June 1857(II)	December 1858 (IV)	18	August 1929(III)	March 1933 (I)	43
October 1860(III)	June 1861 (III)	8	March 1882(I)	May 1885 (II)	38
April 1865(I)	December 1867 (I)	32	April 1865(I)	December 1867 (I)	32
June 1869(II)	December 1870 (IV)	18	January 1910(I)	January 1912 (IV)	24
October 1873(III)	March 1879 (I)	65	September 1902(IV)	August 1904 (III)	23
			January 1913(I)	December 1914 (IV)	23
March 1882(I)	May 1885 (II)	38			
March 1887(II)	April 1888 (I)	13	**Second Quintile**		
July 1890(III)	May 1891 (II)	10	June 1857(II)	December 1858 (IV)	18
January 1893(I)	June 1894 (II)	17	June 1869(II)	December 1870 (IV)	18
December 1895(IV)	June 1897 (II)	18	December 1895(IV)	June 1897 (II)	18
			June 1899(III)	December 1900 (IV)	18
June 1899(III)	December 1900 (IV)	18	January 1920(I)	July 1921 (III)	18
September 1902(IV)	August 1904 (III)	23	**December 2007 (IV)**	**June 2009 (II)**	**18**
May 1907(II)	June 1908 (II)	13	January 1893(I)	June 1894 (II)	17
January 1910(I)	January 1912 (IV)	24			
January 1913(I)	December 1914 (IV)	23	**Third Quintile**		
			November 1973(IV)	March 1975 (I)	16
August 1918(III)	March 1919 (I)	7	July 1981(III)	November 1982 (IV)	16
January 1920(I)	July 1921 (III)	18	May 1923(II)	July 1924 (III)	14
May 1923(II)	July 1924 (III)	14	March 1887(II)	April 1888 (I)	13
October 1926(III)	November 1927 (IV)	13	May 1907(II)	June 1908 (II)	13
August 1929(III)	March 1933 (I)	43	October 1926(III)	November 1927 (IV)	13
			May 1937(II)	June 1938 (II)	13
May 1937(II)	June 1938 (II)	13			
February 1945(I)	October 1945 (IV)	8	**Forth Quintile**		
			November 1948(IV)	October 1949 (IV)	11
November 1948(IV)	October 1949 (IV)	11	December 1969(IV)	November 1970 (IV)	11
July 1953(II)	May 1954 (II)	10	July 1890(III)	May 1891 (II)	10
August 1957(III)	April 1958 (II)	8	July 1953(II)	May 1954 (II)	10
			April 1960(II)	February 1961 (I)	10
April 1960(II)	February 1961 (I)	10			
December 1969(IV)	November 1970 (IV)	11	**Fifth Quintile**		
November 1973(IV)	March 1975 (I)	16	October 1860(III)	June 1861 (III)	8
January 1980(I)	July 1980 (III)	6	February 1945(I)	October 1945 (IV)	8
July 1981(III)	November 1982 (IV)	16	August 1957(III)	April 1958 (II)	8
			July 1990(III)	March 1991(I)	8
July 1990(III)	March 1991(I)	8	March 2001(I)	November 2001 (IV)	8
March 2001(I)	November 2001 (IV)	8	August 1918(III)	March 1919 (I)	7
			January 1980(I)	July 1980 (III)	6
December 2007 (IV)	June 2009 (II)	18			

Source: National Bureau of Economic Research, Inc.

Table A1-2
U.S. Business Cycle Expansions and Contractions

Mild

Rank	Peak	Trough	Duration in Months Contraction Peak to Trough (0-10 Months)
2	October 1860(III)	June 1861 (III)	8
1	July 1890(III)	May 1891 (II)	10
3	August 1918(III)	March 1919 (I)	7
2	February 1945(I)	October 1945 (IV)	8
1	**July 1953(II)**	**May 1954 (II)**	10
2	**August 1957(III)**	**April 1958 (II)**	8
1	**April 1960(II)**	**February 1961 (I)**	10
4	**January 1980(I)**	**July 1980 (III)**	6
2	**July 1990(III)**	**March 1991(I)**	8
2	**March 2001(I)**	**November 2001 (IV)**	8

Moderate

Rank	Peak	Trough	Duration in Months Contraction Peak to Trough (11-18 Months)
1	June 1857(II)	December 1858 (IV)	18
1	June 1869(II)	December 1870 (IV)	18
5	March 1887(II)	April 1888 (I)	13
2	January 1893(I)	June 1894 (II)	17
1	December 1895(IV)	June 1897 (II)	18
1	June 1899(III)	December 1900 (IV)	18
5	May 1907(II)	June 1908 (II)	13
1	January 1920(I)	July 1921 (III)	18
4	May 1923(II)	July 1924 (III)	14
5	October 1926(III)	November 1927 (IV)	13
5	May 1937(II)	June 1938 (II)	13
6	**November 1948(IV)**	**October 1949 (IV)**	11
6	**December 1969(IV)**	**November 1970 (IV)**	11
3	**November 1973(IV)**	**March 1975 (I)**	16
3	**July 1981(III)**	**November 1982 (IV)**	16
	December 2007 (IV)	**June 2009 (II)**	18

Severe

Rank	Peak	Trough	Duration in Months Contraction Peak to Trough (>18 Months)
4	April 1865(I)	December 1867 (I)	32
1	October 1873(III)	March 1879 (I)	65
3	March 1882(I)	May 1885 (II)	38
6	September 1902(IV)	August 1904 (III)	23
5	January 1910(I)	January 1912 (IV)	24
6	January 1913(I)	December 1914 (IV)	23
2	August 1929(III)	March 1933 (I)	43

Note: Dates in bold are post-WWII recessions. Dates underlined are post-1970 recessions.

Appendix 2

Table A2-1
Quarterly Postal Volumes Over 2005-2011

	Date	Postal FY	SP Ltr	PS Ltr	FCM (SP+PS)	Std Ltr	Std Total	Periodicals
	October-December 2004 (IV)	2005Q1	12,377.261	12,624.264	25,001.525	13,517.725	26,948.833	2,336.496
	January-March 2005 (I)	2005Q2	10,659.779	12,610.320	23,270.099	13,223.325	24,328.187	2,292.105
	April-June 2005 (II)	2005Q3	10,311.343	11,918.562	22,229.905	13,372.725	24,126.648	2,285.375
	July-September 2005 (III)	2005Q4	10,027.606	11,912.406	21,940.011	13,815.090	25,538.424	2,156.027
	October-December 2005 (IV)	2006Q1	11,531.475	12,439.837	23,971.313	13,976.089	27,071.603	2,293.806
	January-March 2006 (I)	2006Q2	10,689.975	12,923.923	23,613.899	13,576.293	24,976.336	2,298.537
	April-June 2006 (II)	2006Q3	10,161.452	12,323.820	22,485.273	13,468.107	24,812.129	2,270.965
	July-September 2006 (III)	2006Q4	9,547.383	12,174.421	21,721.803	13,821.287	25,599.491	2,159.254
	October-December 2006 (IV)	2007Q1	11,332.503	12,548.404	23,880.906	14,561.595	28,410.608	2,177.044
	January-March 2007 (I)	2007Q2	9,887.565	13,103.714	22,991.279	13,899.197	25,291.072	2,253.539
	April-June 2007 (II)	2007Q3	9,855.153	12,236.548	22,091.702	13,801.732	24,584.387	2,265.246
	July-September 2007 (III)	2007Q4	9,046.522	12,089.776	21,136.297	14,292.595	25,230.045	2,100.002
R E C E S S I O N	October-December 2007 (IV)	2008Q1	10,620.726	12,327.001	22,947.726	15,240.648	27,634.215	2,202.035
	January-March 2008 (I)	2008Q2	9,311.807	12,949.681	22,261.489	13,809.998	24,530.722	2,159.203
	April-June 2008 (II)	2008Q3	8,907.066	12,061.841	20,968.907	13,128.330	23,216.603	2,190.673
	July-September 2008 (III)	2008Q4	7,876.065	11,824.441	19,700.506	13,150.643	23,702.615	2,053.315
	October-December 2008 (IV)	2009Q1	9,521.716	11,852.102	21,373.818	12,628.658	24,530.280	2,114.397
	January-March 2009 (I)	2009Q2	8,224.006	11,948.124	20,172.131	10,813.700	19,759.308	1,979.585
	April-June 2009 (II)	2009Q3	7,703.844	11,206.522	18,910.366	10,278.338	18,699.639	1,976.653
	July-September 2009 (III)	2009Q4	7,337.994	10,958.078	18,296.072	10,479.999	19,517.772	1,830.264
	October-December 2009 (IV)	2010Q1	8,794.147	11,170.264	19,964.411	11,551.846	21,867.461	1,870.570
	January-March 2010 (I)	2010Q2	7,059.574	11,337.638	18,397.213	10,904.359	19,847.692	1,830.305
	April-June 2010 (II)	2010Q3	7,019.766	10,597.471	17,617.238	10,839.170	19,559.359	1,839.599
	July-September 2010 (III)	2010Q4	6,531.934	10,538.886	17,070.820	11,745.796	21,250.263	1,728.996
	October-December 2010 (IV)	2011Q1	7,971.342	10,836.699	18,808.041	15,915.067	23,756.705	1845.749
	January-March 20011 (I)	2011Q2	6,491.926	10,941.141	17,433.067	13,921.190	20,161.423	1747.473
	April-June 2011 (II)	2011Q3						

Note: Yellow highlighted numbers are letters volume adjusted for flats and parcels, where,
for SP and PS, 80% of flats and parcels are added to SP and the rest to PS.
For std letters, all the flats and parcels are added.

Source: Quarterly RPW, 2005-2011.

27

Two years of post recession experience with postal volumes during economic recovery and the continuing impact of diversion on them enable a much more accurate analysis of the relative contributions diversion and the recession made to postal volumes during the 2008-2009 recession than was possible in our initial comments. We now have pre - recession, recession, and post – recession mail volume data due to Internet diversion from which we can estimate the current broadband-dominated, long run trend in explaining declines in FCLM.[9] From that trend using post - recession data, we can separate that portion of the volume decline due to the Internet during the six quarters of the recession from that portion explainable by the short term influences of the recession.

The dating of a macroeconomic trough was one quarter before the corresponding trough in mail volume on July – October 2009. The start of the recession was one quarter after the peak, January – March 2008. As noted in the body of the analysis in Section III. B., for mail categories that were impacted by the recession in any material way, the best fit estimations below which exclude recession volumes, must be based on post-recession data that is adjusted upwards from the actual data, as if the recession had not happened. Such an adjustment becomes a complex matter unless only a linear forecast is made from pre-recession trends, as was done in Section III. B.

It is not straightforward to make that adjustment here, however, as the relative gaps between estimation using all postal volume data by major category for actual pre- and post- recession are based on non-linear estimations for both equations. The absolute size of the gaps in the figures that follow is less than those from Section III. B., but it is only the relative gap that is of interest here. As is also true of the conclusions from Section III. B., the relative gap is greater for

---

[9] We can also use the same estimation techniques for determining how much long term trend factors versus the short run 2008-2009 recession explain volume drops in Standard and Periodicals. While these are not the focus of our analysis, the statistical results are presented in Appendix Two, along with FCM.

Standard letter mail and all Standard mail, than it is for FCLM. The case of Presort is more difficult to compare, in part because it is anomalous.
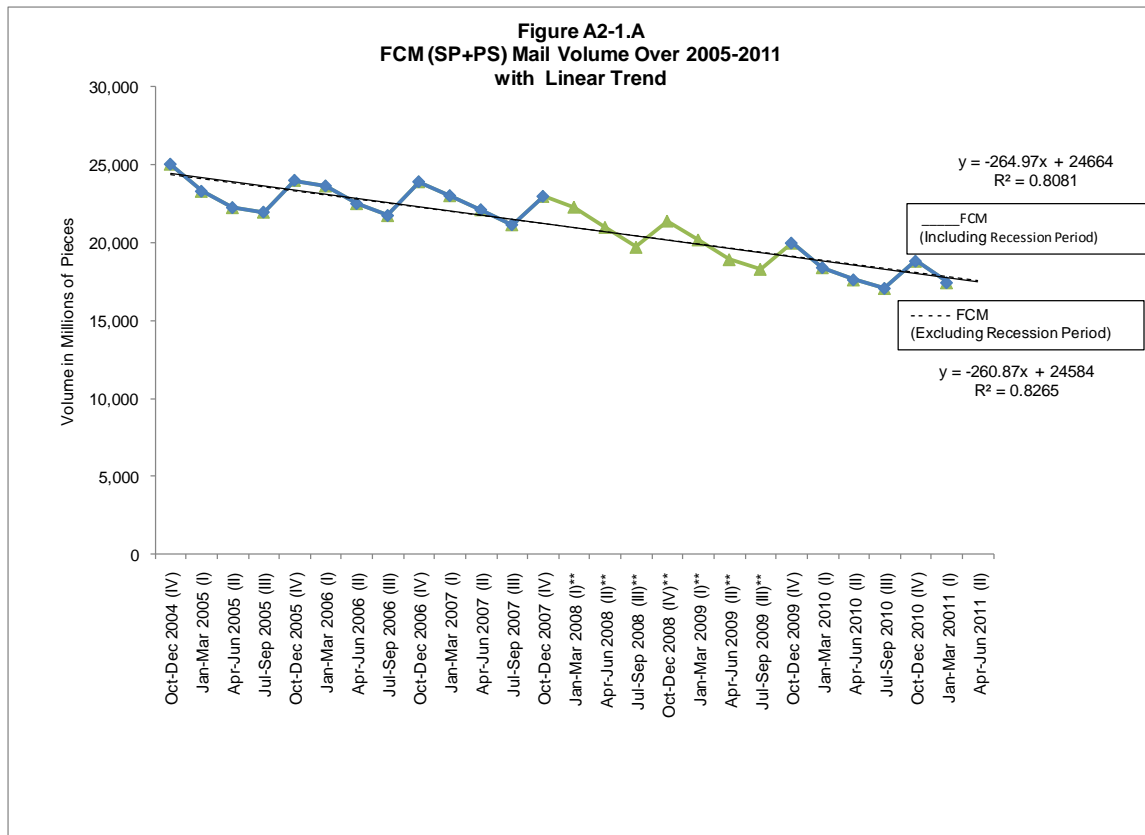
A.   FCLM as a Whole

We performed linear and non-linear fits to postal volume data from the first quarter of PFY 2005 through the second quarter of PFY 2011 using RPW data. Beyond all First Class mail letters, Presort and Single Piece, the database includes flats and parcels, but nearly all the volume reported is letter mail. For each estimation, all the data except the six quarters of the 2008-2009 recession was run to establish the current long run trend in FCM volume absent the short term influence of the recession. Then, all the postal volume data for that estimation technique was re-run using all the data including the six quarterly observations from the recession.

If the recession itself had an independent and observable impact on the volume of FCM as a whole, it would show up as a difference in the two estimated equations, notably in the slope coefficient. The smaller the difference in the equations, the less the influence of the recession.

The linear equations estimated for FCLM as a whole are:

(1) $y = -260.87x + 24584$ $R^2 = 0.8265$ Recession data excluded

(2) $y = -264.97x + 24664$ $R^2 = 0.8081$ Recession data included

Figure A2-1.A
FCM (SP+PS) Mail Volume Over 2005-2011
with Linear Trend

The linear equations shown in <u>Figure A2-1.A</u> are both reasonable fits to the quarterly data, with the level of statistical significance exceeding 80%. The current long run trend of declines in FCLM as a whole established in the first equation is nearly identical to the values and significance in the second equation. The comparison strongly suggests that even if there had not been a recession in 2008-2009, FCLM volumes would have continued to fall at the same rate that they did during and after the recession. Put differently, the results strongly suggest that one cannot discern much impact from the recession on FCLM volumes taken as a whole. The values of the slope coefficients are about one and a half percent different (0.0157), using either coefficient as the base value.
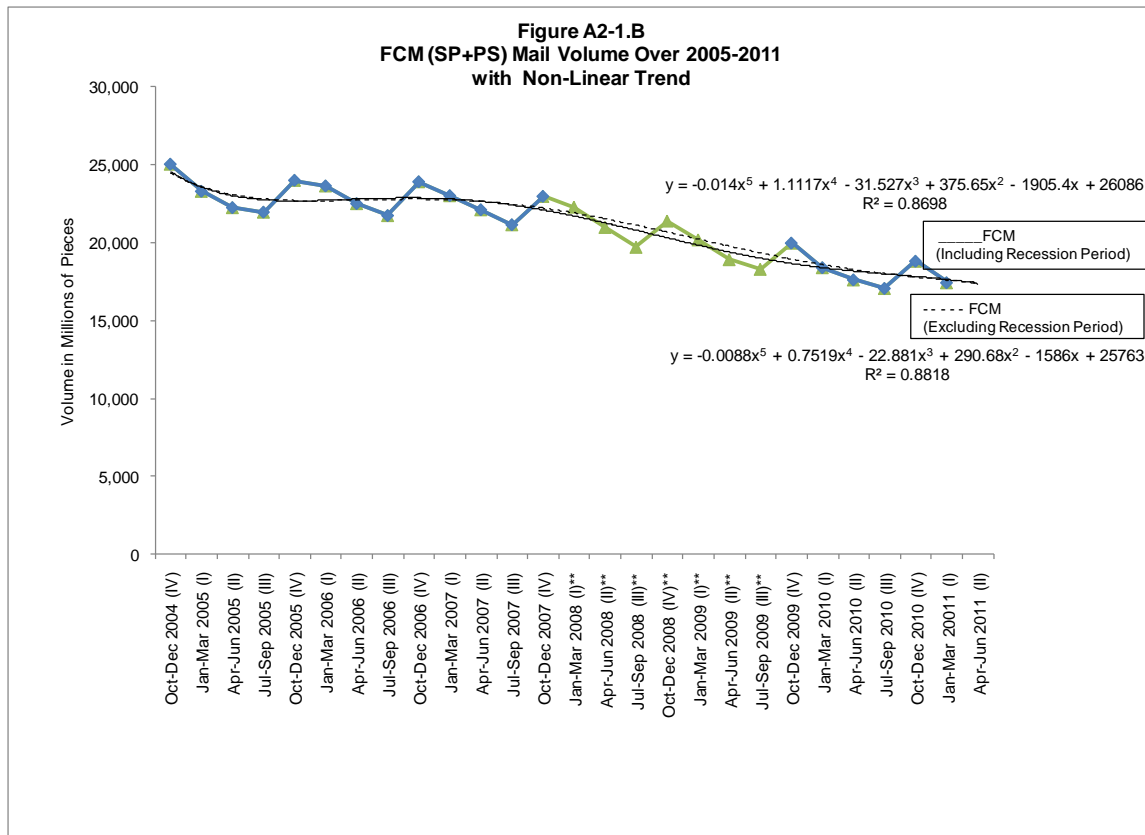
However, recessions tend to be non-linear events just as recoveries and booms are, and one must use non-linear estimation techniques as well and compare them before drawing the conclusion the 2008-2009 recession had no impact whatsoever on the course of FCLM volume. Using non-linear techniques

for estimating both data sets produced a higher degree of statistical significance for both data sets than linear techniques, as shown below in equations (3) and (4).

(3) $y = -0.0088x^5 + 0.75197x^4 - 22.881x^3 + 290.68x^2 - 1586x + 25763$ $R^2 = 0.8818$ Recession data excluded

(4) $y = -0.014x^5 + 1.1117x^4 - 31.527x^3 + 375.65x^2 - 1905.4x + 26086$ $R^2 = 0.8698$ Recession data included

As shown below in Figure A2-1.B, these non-linear trend lines overlay each other with a fairly tight fit. This indicates that long run factors, Internet diversion in particular, explain all or nearly all FCLM volumes during the 2008-2009 recession. The impact of the recession does not materially change the estimated equation in (4) from what it is in (3) for FCLM with the recession data excluded.

Figure A2-1.B
FCM (SP+PS) Mail Volume Over 2005-2011
with Non-Linear Trend

$y = -0.014x^5 + 1.1117x^4 - 31.527x^3 + 375.65x^2 - 1905.4x + 26086$
$R^2 = 0.8698$

FCM (Including Recession Period)

FCM (Excluding Recession Period)

$y = -0.0088x^5 + 0.7519x^4 - 22.881x^3 + 290.68x^2 - 1586x + 25763$
$R^2 = 0.8818$

B. First Class Presort letters

We performed linear and non-linear fits to Presort volume data from the first quarter of PFY 2005 through the second quarter of PFY 2011 using RPW data, using the two best fit estimations as discussed above for FCLM

The linear equations estimated for Presort letters, are:

(5) $y = -78.16x + 12884$ $R^2 = 0.7149$ Recession data excluded

(6) $y = -77.25x + 12945$ $R^2 = 0.6334$ Recession data included

Figure A2-2.A
Presort Letters Mail Volume Over 2005-2011
with Linear Trend
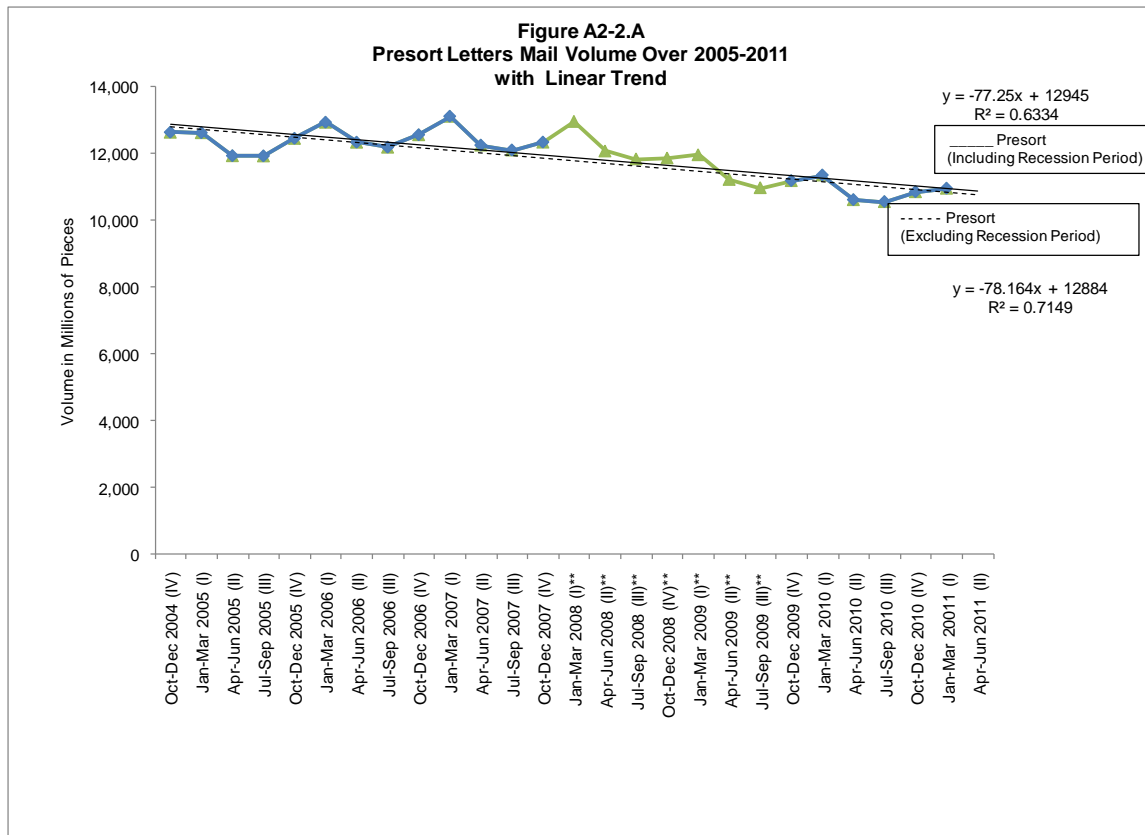
The linear equations shown in <u>Figure A2-2.A</u> are not highly close fits to the quarterly data, with the level of statistical significance as low as 0.633, indicating that there are other factors influencing Presort volumes beyond an internet trend variable and the possible influence of the recession as well. The current long run trend of Presort volume established in equation five is a negative slope coefficient about 1.16% steeper than that in equation six, which includes recession data. This is a bit of an anomaly because one would expect the downward pressure from the recession to have either a little impact or a moderate impact in reducing Presort volumes. Instead, the Presort slope coefficients including recession data suggests the recession considered apart from trend had a modest ameliorating effect on the slow secular decline in Presort mail. This anomaly could be explained by relatively low R^2 values, and might reverse itself if non-linear estimations are made. Taken literally, if secular declines in Presort volume were lessened by virtue of the recession, no exigent rate increase would be warranted for Presort mail because the recession
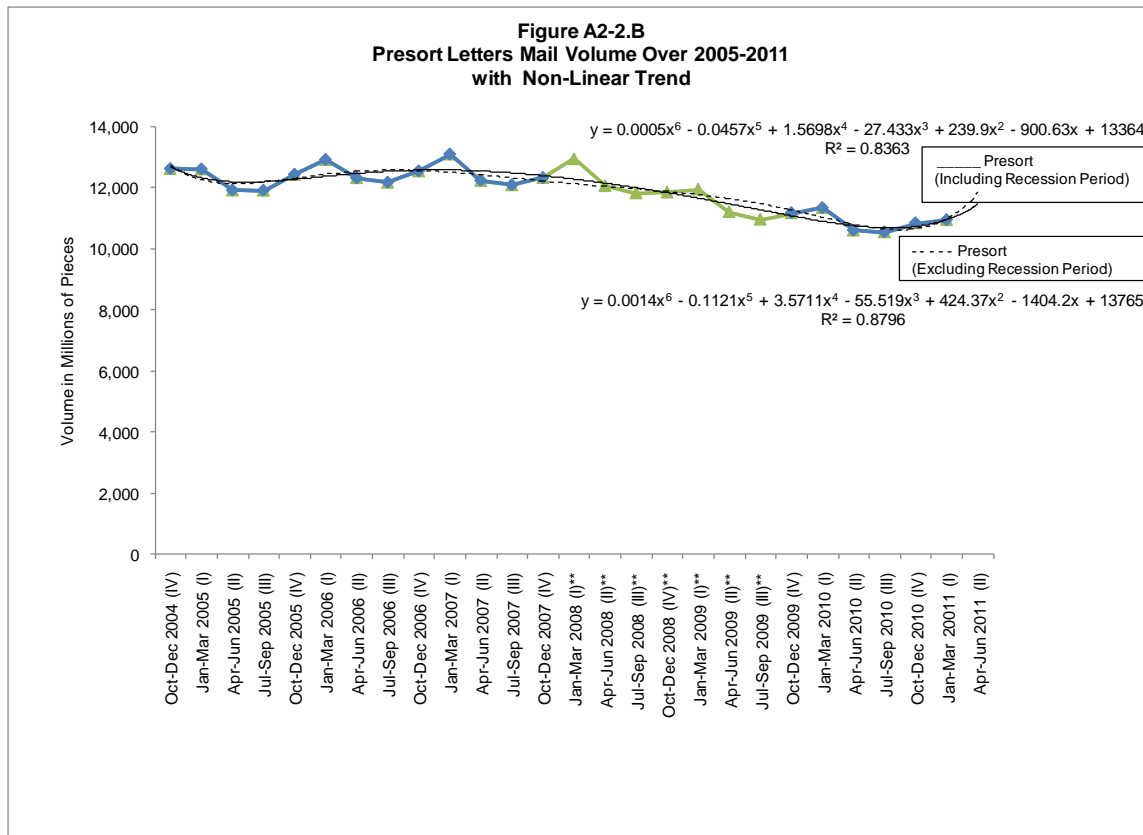
33

generated extra volume and revenue for the Postal Service for Presort than would have been the case without the recession.

Using non-linear estimation for both data sets below significantly increases the explanatory power of the equations in explaining the trends in Presort volumes for both data sets, with and without recession data included.

(7) $y = 0.0014x^6 - 0.1121x^5 + 3.5711x^4 - 55.519x^3 + 424.37x^2 - 1404.2x + 13765$ $R^2 = 0.8796$ Recession data excluded

(8) $y = 0.0005x^6 - 0.04574x^5 + 1.5698x^4 - 27.433x^3 + 239.9x^2 - 900.63x + 13364$ $R^2 = 0.8363$ Recession data included

How does one interpret these findings? We can begin by mapping the two non linear curves on top of each other, as done in Figure A2-2.B, below. For the last half of the 2008-2009 recession, it appears that Presort volume was negatively impacted by the recession by a modest amount. However, the anomaly present in the linear runs is still apparent in the first half of the recession with non-linear estimation, namely that Presort volume appears to be modestly higher during the first half of the recession than it would have been had the recession not occurred.

Figure A2-2.B
Presort Letters Mail Volume Over 2005-2011
with Non-Linear Trend

$y = 0.0005x^6 - 0.0457x^5 + 1.5698x^4 - 27.433x^3 + 239.9x^2 - 900.63x + 13364$
$R^2 = 0.8363$

—— Presort (Including Recession Period)

- - - - Presort (Excluding Recession Period)

$y = 0.0014x^6 - 0.1121x^5 + 3.5711x^4 - 55.519x^3 + 424.37x^2 - 1404.2x + 13765$
$R^2 = 0.8796$

D.   Standard Letter Mail and All Standard Mail

For Standard letter volumes, results using linear estimation were not at all statistically significant for the two data sets with and without recession data included, with R^2 both below 17 percent.
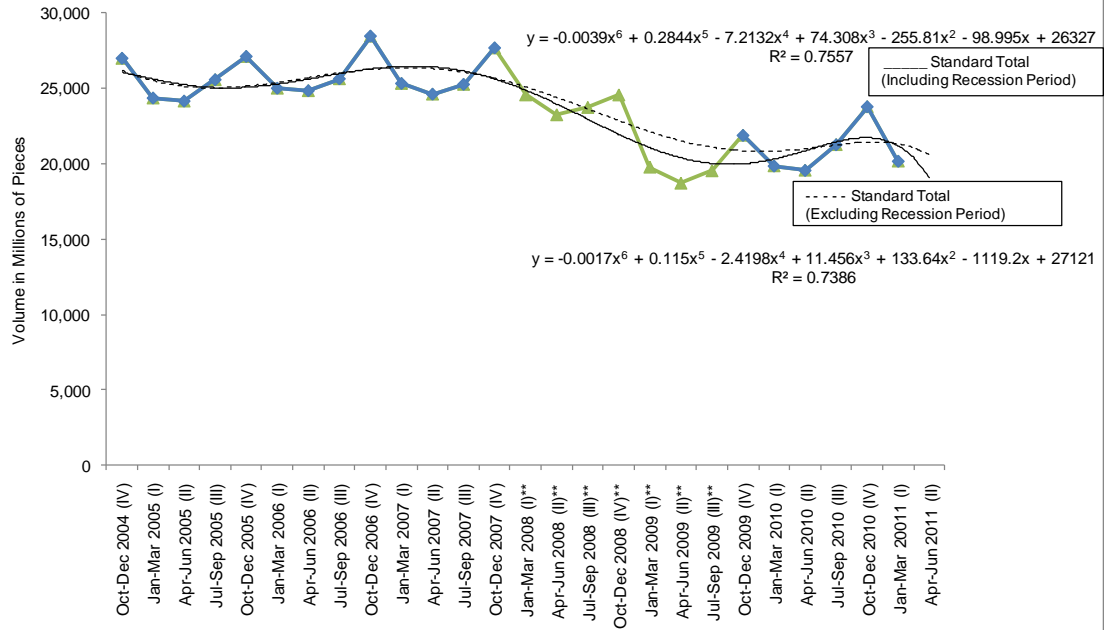
Non-linear estimations techniques, as indicated in equations (11) and (12) for all Standard Mail did prove statistically significant, with an R^2 of 0.7386 excluding recession period data, and 0.7557 including recession data for All Standard Mail. The R^2 for Standard letters in equations (13) and (14) was 0.7933 for data including the recession period, and 0.6909 for data excluding the recession period.
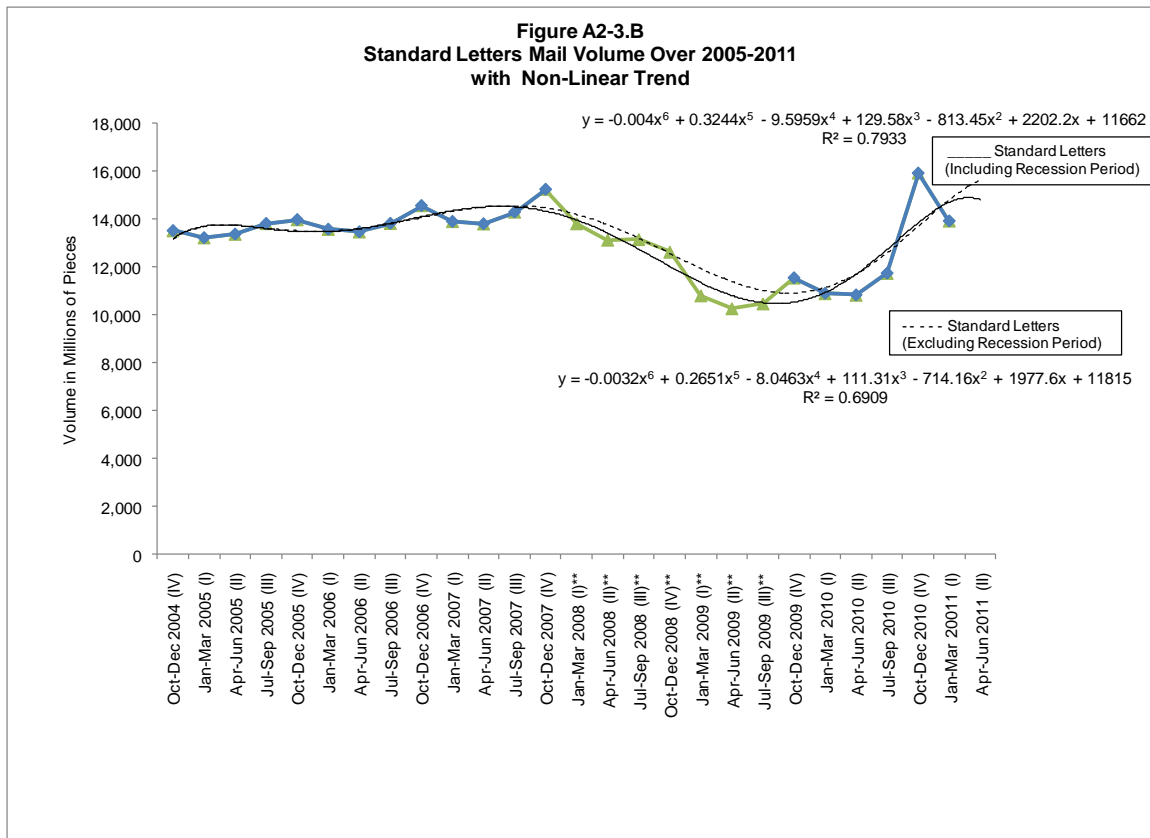
(11) $y = -0.0017x^6 + 0.115x^5 - 2.4198x^4 + 11.456x^3 + 133.64x^2 - 1119.2x + 27121$ $R^2 = 0.7386$ Recession data excluded

$$(12) \quad y = -0.0039x^6 + 0.2844x^5 - 7.2132x^4 + 74.308x^3 - 255.81x^2$$
$$- 98.995x + 26327 \quad R^2 = 0.7557 \quad \text{Recession data included}$$

Both pairs of equations, those for all Standard mail and those for Standard letter mail, indicate that the recession had a substantial impact on Standard mail volumes apart from any secular or long run trends occurring when the recession data was absent. The long run trend in volume for Standard letters, which includes data for flats and not flat-machinables and parcels, is slow growth for a mature product, as is evident from the non-linear trend line excluding the recession in Figure A2-3.B. A recession interrupts that pattern and Standard letter volumes fall during a recession because of the recession and for no other reason, before recovering and resuming their normal pattern of slow growth. The long run trend absent recession for all Standard mail in Figure A2-3.A is a moderate decline. This different trend is driven by the impact of high density and saturation letters, flats and parcels as well as carrier route mail.

Figure A2-3.A
Standard Total Mail Volume Over 2005-2011
with Non-Linear Trend

$y = -0.0039x^6 + 0.2844x^5 - 7.2132x^4 + 74.308x^3 - 255.81x^2 - 98.995x + 26327$
$R^2 = 0.7557$

Standard Total
(Including Recession Period)

Standard Total
(Excluding Recession Period)

$y = -0.0017x^6 + 0.115x^5 - 2.4198x^4 + 11.456x^3 + 133.64x^2 - 1119.2x + 27121$
$R^2 = 0.7386$

Volume in Millions of Pieces

Figure A2-3.B
Standard Letters Mail Volume Over 2005-2011
with Non-Linear Trend

(13) $y = -0.004x^6 + 0.3244x^5 - 9.5959x^4 + 129.58x^3 - 813.45x^2 + 2202.2x + 11662$ $R^2 = 0.7933$ Recession data excluded

(14) $y = -0.0032x^6 + 0.2651x^5 - 8.0463x^4 + 111.31x^3 - 714.16x^2 + 1977.6x + 11815$ $R^2 = 0.6909$ Recession data included